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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,180	08/03/2001	Chiaki Senoo	50026/027001	1189

21559 7590 05/23/2006

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EXAMINER	
SWOPE, SHERIDAN	

ART UNIT	PAPER NUMBER
1656	

DATE MAILED: 05/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/831,180	SENOO ET AL.	
	Examiner	Art Unit	
	Sheridan L. Swope	1656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *9-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 15* is/are rejected.

7)☒ Claim(s) *3 and 4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 August 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicants' election with traverse of Invention I, Claims 1-4, and subinvention (A), SEQ ID NO: 2, in their response of April 7, 2006 is acknowledged. Applicants' traversal is based on the argument that, as amended, the claims are limited to the elected sequence, SEQ ID NO: 2 as encoded by SEQ ID NO: 1. Said argument is not found to be persuasive because Claim 15 has not been amended to recited only the elected subjected matter.

Interview Summary: In a telephonic interview with James DeCamp on May 15, 2006, Mr. DeCamp informed the Examiner that Applicants' intention was to amend Claim 15 to recite only the elected sequence, SEQ ID NO: 2, and to remove their withdrawal of Claims 5-8 and 15, so that said claims may be examined.

Claims 1-15 are pending. The Lack of Unity requirement between Claim 1-4 and Claims 5-8 and 15 is withdrawn. Claims 9-14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim. Claims 1-8 and 15 are hereby examined.

Priority

The priority date of the instant invention is taken to be November 4, 1998, the filing date of JAPAN 10/313366, which discloses SEQ ID NO: 1 and SEQ ID NO: 2.

Drawings

The drawings are objected to for disclosing sequence(s) that are not identified by a sequence identifier number (SEQ ID NO:). The sequence rules embrace all nucleotide sequences with ten or more bases and all amino acid sequences with four or more amino acids. Said sequences must be disclosed in a sequence listing and identified by a specific SEQ ID NO:

(MPEP 2421.02). 37 CFR 1.821(d) requires the use of the assigned sequence identifier number in all instances where the description or claims of a patent application discuss sequences, regardless of whether a given sequence is also embedded in the text of the description or claims of an application. Applicant is required to carefully check the drawings and make corrections to identify all of the sequences disclosed therein by sequence identifier numbers.

Figure 12 is objected to because lanes 1-22 therein are not identified.

Specification-Objections

The specification, for example at pages 38, 44, and 47, discloses sequence(s) that are not identified by a sequence identifier number (SEQ ID NO:). The sequence rules embrace all nucleotide sequences with ten or more bases and all amino acid sequences with four or more amino acids. Said sequences must be disclosed in a sequence listing and identified by a specific SEQ ID NO: (MPEP 2421.02). 37 CFR 1.821(d) requires the use of the assigned sequence identifier number in all instances where the description or claims of a patent application discuss sequences, regardless of whether a given sequence is also embedded in the text of the description or claims of an application. Applicant is required to carefully check the complete specification and make corrections, to identify all of the sequences disclosed therein by sequence identifier numbers.

Claims-Objections

The claim set is objected to for not beginning with a sentence of which the claims are an object e.g., "We claim" or "The claims are".

Claims 3 and 4 are objected to for non-standard Markush language. The phase "any one of claims 1 and 2" should be amended to "any one from the group consisting of claims 1 and 2" or "either claim 1 or 2".

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Utility

Claims 1-8 and 15 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility. The specification fails to teach a specific and substantial function for the protein set forth by SEQ ID NO: 2, as encoded by SEQ ID NO: 1. Based on the specification, page 1, paragraph 1, the asserted utility for said protein is as a trypsin-family serine protease. Said assertion for the protein of SEQ ID NO: 2 is not supported by any experimental evidence; for example, analysis of the protein for protease activity. In addition, a utility for the protein of SEQ ID NO: 2 as a trypsin-like protease is not supported by homology to any protein with known function. Sequence searches by the Office failed to identify homology of SEQ ID NO: 2 with any protein having demonstrated trypsin-like activity.

As stated in the specification at page 4, paragraph 3, the proposed biological function for the protein of SEQ ID NO: 2 is in "sperm differentiation and maturation and/or sperm function (fertilization)". It is acknowledged that the specification provides evidence that the polynucleotide encoding the protein of SEQ ID NO: 2, SEQ ID NO: 1, is most abundant in adult testis (Figs 7 & 8). However, based on high levels of expression in adult testis, a person of ordinary skill in the art would not believe that it is more likely than not that the protein of SEQ

ID NO: 2 is involved in either sperm differentiation and/or fertilization. Moreover, assertion that the biological function for the protein of SEQ ID NO: 2 is in sperm differentiation and/or fertilization is not an assertion of a specific and substantial utility, since sperm differentiation and fertilization are biologically distinct processes.

Therefore, Claims 1-8 and 15 are rejected under 35 U.S.C. 101 because the claimed invention lacks a patentable utility.

Claims 1-8 and 15 also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 112-Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-8 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention for the following reasons.

Claim 2 recites the limitation "functionally equivalent". Neither the claims nor the specification provide a definition of "functionally equivalent". A person of ordinary skill in the art would not know the metes and bounds of the invention. Claims 3-8, as dependent from Claim 2, are rejected under 35 U.S.C. 112, second paragraph, for the same reason.

Claim 4 recites the limitation "the first protein". There is insufficient antecedent basis for this limitation in the claim. A person of ordinary skill in the art would not know the metes and bounds of the invention.

Claim 6 is indefinite because it is unclear whether the recited vector comprises the DNA according to Claim 5 or is an empty vector into with said DNA will be inserted. The latter would include any empty vector. For purposes of examination, it is assumed that Claim 6 is meant to recite a vector comprising the DNA according to Claim 5.

Claims 7 and 8 are indefinite because the term "transformant" can encompass either or both of transformed cells and transformed organisms. However, the specification fails to describe the use of the recited DNA in the making of transformed organisms. For purposes of examination, it is assumed that Claims 7 and 8 are meant to recite a transformed cell.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 15 is indefinite in the recitation of "hybridizing to" as this term is unclear absent a statement of the conditions under which the hybridization reaction is preformed. Nucleic acids that will hybridize under some hybridization conditions, will not necessarily hybridize under different conditions. Thus, Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Claim Rejections - 35 USC § 112-First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Enablement

Even if Claims 1-8 and 15 were not rejected under 35 U.S.C. 112, first paragraph, for the reasons stated above, the following rejection would be made.

Claims 2-8 and 15 are rejected under 35 U.S.C. 112, first paragraph, because the specification does not reasonably provide enablement for an protein that is functionally equivalent to a protein comprising SEQ ID NO: 2, any fragment thereof, any encoding polynucleotide, or any polynucleotide of at least 15 bases that hybridizes to SEQ ID NO: 1. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

In regards to this enablement rejection, the application disclosure and claims are compared per the factors indicated in the decision In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). These factors are considered when determining whether there is sufficient evidence to support a description that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is undue. The factors include but are not limited to: (1) the nature of the invention; (2) the breath of the claims; (3) the predictability or unpredictability of the art; (4) the amount of direction or guidance presented; (5) the presence or absence of working examples; (6) the quantity of experimentation necessary; (7) the relative skill of those skilled in the art. Each factor is here addressed on the basis of a comparison of the disclosure, the claims, and the state of the prior art in the assessment of undue experimentation.

Claim 2 is so broad as to encompass any polypeptide that is functionally equivalent to any protein comprising SEQ ID NO: 2, wherein the polypeptide comprises (i) SEQ ID NO: 2 with up to 30 modifications or (ii) a protein encoded by a polynucleotide that hybridizes to SEQ

ID NO: 1 at high stringency. Claim 3 is so broad as to encompass any fragment of any polypeptide encompassed by Claim 2. Claim 15 is so broad as to encompass any nucleotide sequence of at least 15 bases that hybridizes to SEQ ID NO: 1. The scope of each of these claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of polypeptides broadly encompassed by the claim. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the protein's structure relates to its function.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims. Furthermore, the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the results of such modifications are unpredictable (Galye et al, 1993; Whisstock et al, 2003). In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of Claim 2 which, encompasses all polypeptides that are functionally equivalent to any protein comprising SEQ ID NO: 2, wherein the polypeptide comprises (i) SEQ ID NO: 2 with up to 30 modifications or (ii) a protein

encoded by a polynucleotide that hybridizes to SEQ ID NO: 1 at high stringency. The specification also does not support the broad scope of Claim 3, which encompasses all fragments of any polypeptide encompassed by Claim 2. The specification does not support the broad scope of Claim 15, which encompasses any nucleotide sequence of at least 15 bases that hybridizes to SEQ ID NO: 1. The specification does not support the broad scope of Claims 2, 3, and 15 because the specification does not establish: (A) the function of all recited polypeptides and polynucleotides; (B) methods for testing the encompassed polypeptides and polynucleotides for the desired activity; (C) regions of the protein structure which may be modified without effecting the desired activity; (D) the general tolerance of the desired activity to modification and extent of such tolerance; (E) a rational and predictable scheme for modifying any residues with an expectation of obtaining the desired biological function; and (F) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Claim 4, as dependent from Claim 2 and reciting a fusion protein thereof, is rejected for the same reason. In addition, since Claims 5-10 further recite DNA molecules encoding the polypeptides of Claims 1-3, vectors, host cells and methods of expressing the nucleic acids, Claims 5-10 are also rejected under 35 U.S.C. 112 first paragraph due to lack of enablement for the same reasons discussed above.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any number of polypeptides with an enormous number of amino acid modifications of the polypeptide of SEQ ID NO: 2 and encoding polynucleotides as well as

any DNA sequence of at least 15 residues that hybridizes to SEQ ID NO: 1 . The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of the identity of sequences having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Written Description

Claims 2-8 and 15 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the Inventors, at the time the application was filed, had possession of the claimed invention. Claims 2-8 are directed to a genus of polypeptides, and the encoding polynucleotides, that are functionally equivalent to any protein comprising SEQ ID NO: 2, wherein the polypeptide comprises (i) SEQ ID NO: 2 with up to 30 modifications or (ii) a protein encoded by a polynucleotide that hybridizes to SEQ ID NO: 1 at high stringency as well as any fragment thereof. Claim 15 is directed to a genus of polynucleotides of at least 15 residues, wherein the polynucleotide hybridizes to SEQ ID NO: 1.

The specification does not contain any disclosure of the function of all said polypeptides and fragments thereof or said polynucleotides. The genera of polypeptides and polynucleotides that comprise these above amino acid and nucleotides sequences are large, variable genera with the potentiality of having many different activities or no activity. Therefore, many functionally unrelated polypeptides and polynucleotides are encompassed within the scope of these claims, including inactive sequences. The specification discloses the function of no single species of the

claimed genera, which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genera. Therefore, one skilled in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Sigma, Inc (1997). Sigma, Inc teach a dipeptide consisting of residues 49 and 50 of SEQ ID NO: 2. Therefore, Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Sigma, Inc (1997).

To insure that each document is properly filed in the electronic file wrapper, it is requested that each of amendments to the specification, amendments to the claims, Applicants' remarks, requests for extension of time, and any other distinct papers be submitted on separate pages.

It is also requested that Applicants identify support, within the original application, for any amendments to the claims and specification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheridan L. Swope whose telephone number is 571-272-0943. The examiner can normally be reached on M-F; 9:30-7 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathleen Kerr can be reached on 571-272-0931. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sheridan Lee Swope, Ph.D.
Art Unit 1656